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AUTHOR Wilkinson, Cheryl Yelich; Holtzman, Wayne H., Jr.
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ABSTRACT

The relationship between the relative language proficiencies of bilingual children and their scores on tests administered in one or both languages was studied in students referred to special education because of suspected learning disabilities. Bilingual Hispanic students (25 males and 15 females) in grades 2 through 4 from an urban school district, who had been referred to special education and were considered as limited English proficient, were assessed using intelligence and achievement tests in English and Spanish. Only a moderate relationship was found between language proficiency and IQ and achievement test scores. Most test means did not differ for Spanish- and English-dominant children. Most of the children demonstrated fairly equal proficiency in both languages. Stronger relationships might have been obtained for children whose proficiency in one language much exceeded their proficiency in the other. The effect of the language of test administration on IQ scores was difficult to assess. However, between 9% and 17% of the group qualified for learning-disabled services on the basis of English (but not Spanish) scores; thus, underscoring the need to consider native language assessment for all bilingual children. Twelve data tables and one graph conclude the document. (SLD)

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Relationships Among Language Proficiency, Language of Test
Administration and Special Education Eligibility for Bilingual
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Cheryl Yelich Wilkinson

Wayne H. Holtzman, Jr.

Department of Special Education

The University of Texas at Austin

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When a bilingual child is referred to special education, school personnel must decide whether academic problems are the result of a handicapping condition or stem from other differences, such as differences in language and culture. Rates of minority group representation in special education suggest that this distinction is often difficult to make. For example, data from the Fall 1978 Elementary and Secondary Schools Civil Rights Survey (U.S. General Accounting Office, 1981) indicate that 44% of Hispanic students and 46% of American Indian students in special education were in classes for the learning disabled, as contrasted with 26% of Blacks and 39% of Anglos. Ortiz and Yates (1983) examined general school and special education population proportions, and found that Hispanics in Texas are overrepresented in programs for the learning disabled (LD) by 315%. These instances of overrepresentation may encompass cases in which student's linguistic/cultural differences are interpreted as indicative of a learning disability.

Results of a comprehensive psychoeducational assessment, including results of IQ and achievement testing, are among the most important factors considered in placing children in LD programs. One assumption behind these assessments is that children's best performance can be elicited under the standardized conditions imposed by the tests used. A large body of previous research has considered what conditions will elicit optimum performance from bilingual children, and has examined variables such as the degree of cultural loading of test content, examiner characteristics, the types of skills included in intelligence tests (typically verbal versus non-verbal) and the language of test administration.

Previous research on language of test administration effects has focused on IQ scores. This research has yielded mixed results. Several studies (e.g., Oplersch & Genshaft, 1981; Palmer & Gaffney, 1972; and Swanson & DeBlassie, 1971) report that scores achieved by Hispanic children on the Wechsler Intelligence Scale for Children (WISC) or its revised version (WISC-R) do not differ for English and Spanish administrations. Other studies (e.g., Bergan & Parra, 1979 and Chandler & Plakos, 1969) report higher WISC-R scores from Spanish and/or bilingual administrations than from English only administrations. A final study (Swanson & DeBlassie, 1979) suggests that some scores are facilitated by English administration while others are facilitated by Spanish. Subjects achieved significantly higher total Verbal, Arithmetic and Vocabulary scores when the WISC was administered in English, and significantly higher Object Assembly scores when the WISC was administered in Spanish.

Differences in findings across studies may be at least partially attributable to subjects' language characteristics. The majority of these studies used some rating or objective measure to confirm that their subjects were Spanish-English bilingual. However, subjects' relative proficiency in both languages was not considered. One study which did assess relative proficiency (Gerkin (1978)) reports differences in IQ scores based on children's language dominance. A major purpose of the present study was to explore the relationship between students' relative language proficiencies and their scores on tests which are administered in one or both languages. The influence of language proficiency and shifts in language of administration was considered for both IQ and achievement test scores.

Additionally, previous research has used statistical significance as the sole criterion for examining changes in scores. However, when a discrepancy model is used to establish the presence of a learning disability, it is also of interest to determine how eligibility percentages would be affected by various testing manipulations. The final purpose of this study was, therefore, to examine the effect of change in language of administration of IQ

and achievement measures on LD eligibility of children from different language dominance groups.

Method

Subjects. Subjects were 40 bilingual Hispanic students (25 males and 15 females) in grades 2 through 4 from an urban school district in Central Texas who had been referred to special education for suspected learning disabilities (LD). All students had been classified by the district as limited English proficient (LEP) using results of a home language survey and language proficiency testing. Twenty-five students (62.5%) were enrolled in bilingual education programs at the time of referral; 15 (37.5%) had been exited previously. The sample represents all current or former LEP students referred to the district's LD program between September, 1985 and December, 1986.

The majority of students (77.5%) were eligible for a free or reduced price lunch, and had been retained prior to referral (66.7%). The average age at initial assessment was 9 years, 5 months (range = 7 years, 8 months to 10 years, 10 months). Sixty-four percent of students were found to be eligible for special education by their district; 36% were not.

Instruments. All students were assessed using: (a) the Wechsler Intelligence Scale for Children - Revised (WISC-R; Wechsler, 1974), administered in English, (b) the achievement and mental processing sections of the Kaufman Assessment Battery for Children (K-ABC; Kaufman & Kaufman, 1983), administered using test publisher's instructions for a bilingual administration, (c) the reading, mathematics and written language subtests of the Woodcock-Johnson Psycho-Educational Battery, administered in English (WJE; Woodcock & Johnson, 1977), (d) the reading, mathematics and written language subtests of the Bateria Woodcock Psico-Educativa en Español, administered in Spanish (BWPE; Woodcock, 1982), and (e) the Language Assessment Scales (LAS; DeAvila & Duncan, 1981), administered in both English and Spanish. The English and Spanish forms of the Woodcock Batteries and the LAS are parallel tests (Woodcock, 1985; DeAvila & Duncan, 1981), while the WISC-R and K-ABC are not. However, no IQ test with parallel English and Spanish forms and norms appropriate for the sample could be found, necessitating the use of two different tests.

Procedures. School records of all Hispanic children referred to special education were examined to determine LEP status. Current or former LEPs were administered the test battery described above by district assessment personnel. In cases where the Woodcock-Johnson achievement tests were not a part of the initial comprehensive assessment, testing was carried out by research teams composed of doctoral level faculty and graduate students who had been trained in the use of the Woodcock Batteries. Nine Spanish test administrations and 24 full achievement batteries were obtained in this manner. The order of English and Spanish testing was counterbalanced across subjects.

Data Preparation and Analysis. Tests were scored by examiners using publisher's instructions. The CompuScore program (Hauger, 1984) was used to score the WJE. Both age and grade standard scores were obtained for the WJE and the BWPE. Preliminary analyses revealed that due to the high rate of retention for referred students, mean age and grade standard scores for all subtests differed significantly (see Table 1). Therefore, analyses were performed separately for age and grade scores.

Results of LAS testing were used to divide subjects into Spanish dominant and English dominant groups. Students whose English LAS overall proficiency level was higher than their Spanish level ($n = 20$) were considered to be English dominant; students whose

Spanish LAS overall proficiency level was higher than their English level ($n = 11$) were considered to be Spanish dominant. Nine students whose English and Spanish proficiency levels were equal were excluded from selected analyses. Examination of raw scores confirmed group differences. The mean English raw score for English dominant students was significantly higher ($p < .05$) than their own raw Spanish mean score and was also significantly higher than the raw English mean score of Spanish dominant children. This same pattern was found for mean Spanish raw scores of Spanish dominant children (see Table 2).

Results

Relationships between language dominance and assessment results.

Several indicators of the relationship between language dominance and assessment results were examined. These included correlations between English and Spanish LAS scores and other test scores, mean differences in the IQ and achievement scores of Spanish dominant and English dominant children, and differences in percentages of Spanish dominant and English dominant students eligible for programs for the learning disabled based on a one standard deviation discrepancy between IQ and achievement.

Correlations among language proficiency, IQ and achievement. Pearson product moment correlations were used to examine the relationship between scores on the English and Spanish LAS and scores on the WISC-R, K-ABC, WJE, BWPE, and their subtests. Of the 70 correlations computed, 21 were statistically significant at the .05 level of probability or less (see Table 3). Higher English LAS scores were associated with higher Full and Verbal Scale WISC-R IQ scores, higher scores on verbally-loaded WISC-R and K-ABC subtests (for example, the WISC-R Similarities subtest and the K-ABC Riddles Achievement subtest), higher WJE reading and math scores and lower scores on the BWPE reading subtest. Higher Spanish LAS scores were associated with lower WISC-R Verbal IQ scores, lower scores on the K-ABC Achievement Composite, and lower scores on the K-ABC Faces and Places and Reading achievement subtests.

Significant correlations were of moderate magnitude. Correlation coefficients ranged from .26 to -.45, indicating that only 6 to 20 percent of the variance in IQ and/or achievement scores was accounted for by LAS scores.

Mean differences in scores for language dominance groups. Differences in scores achieved by English and Spanish dominant students on the WISC-R, the K-ABC, and the Woodcock batteries and their subtests were compared using a series of t -tests (see Tables 4, 5, and 6). English dominant students achieved significantly higher scores ($p < .05$) on the WISC-R Verbal IQ scale, the WISC-R Information, Vocabulary and Comprehension subtests, the Faces and Places, Riddles and Reading/Decoding K-ABC achievement subtests, the K-ABC achievement composite, and the WJE reading age and grade scores. In general, higher scores were achieved by English dominant children on tests which tap English verbal skills.

Differences in LD eligibility for language dominance groups. Children are considered to be eligible for programs for the learning disabled when a significant discrepancy exists between their assessed intellectual functioning and their achievement. The discrepancy may not be caused by mental retardation, visual or hearing problems or linguistic/cultural difference. In Texas, a significant discrepancy is defined as a difference of one standard deviation or more (Texas Education Agency, 1985). When tests which have

a mean of 100 and a standard deviation of 15 are used, a 16 point difference is taken as evidence of a disability.

To examine LD eligibility of English and Spanish dominant students, all IQ and achievement scores were converted to a scale having a mean of 100 and a standard deviation of 15. Next, a series of discrepancies were calculated. The Full, Verbal and Performance scores from the WISC-R and the Mental Processing Composite, and Simultaneous and Sequential scores from the K-ABC were used as estimates of IQ; reading, math, and written language age and grade scores from the WJE and the BWPE and reading/decoding, reading understanding, math, and achievement composite scores from the K-ABC were used as measures of achievement. A total of 96 discrepancy scores were calculated for each child.

Discrepancy scores were used to find the number and percentage of children from each language dominance group who would be eligible for LD programs given scores from the various IQ-achievement test combinations (see Tables 7, 8, and 9). The greatest percentage of children were eligible when the Performance Scale IQ scores and/or age achievement scores were used in discrepancy calculations. A series of chi squares were used to examine the independence of language dominance and eligibility status for each IQ-achievement discrepancy. The only significant result occurred for the WISC-R Performance IQ and the K-ABC Achievement Composite, which showed Spanish dominant children to be eligible for special education, but did not show similar eligibility for English dominant children (Corrected chi squared = 4.90 with 1 degree of freedom; $p = .03$). Overall, eligibility percentages were highly similar for Spanish dominant and English dominant children. Greater changes in the percentage of eligible students resulted from changes in the tests used to calculate the IQ-achievement discrepancy than from changes in language dominance.

Effects of native language testing on mean scores and LD eligibility.

Results of English and Spanish IQ and achievement testing were compared for both language dominance groups. Interactions of language of testing with language dominance were of particular interest, as was the impact of changes in test scores brought about by a change in IQ test or test language on special education eligibility.

WISC-R versus K-ABC mean scores. A 2 X 2 repeated measures analysis of variance in which IQ scores (WISC-R Full Scale score or K-ABC Mental Processing Composite) were treated as a within subjects factor and language dominance (English or Spanish) was treated as a between subjects factor was used to compare scores on the WISC-R and K-ABC. K-ABC scores were significantly higher than WISC-R scores across language dominance groups (M for K-ABC = 84.9, M for WISC-R = 79.8, F for test effect = 6.16, $p = .02$). No significant language dominance effect or test by language dominance interaction was found.

Spanish versus English achievement scores. Two by two repeated measures analyses of variance like those described above were used to compare WJE scores to BWPE scores. Analyses were conducted separately for reading, math and written language age and grade standard scores.

A significant interaction between language dominance and language of testing was found for both age and grade reading scores (F for age score interaction term = 35.42, $p = .0002$; F for grade score interaction term = 19.66, $p = .0009$). English dominant children scored higher when the reading subtest was administered in English than when it was

administered in Spanish, while Spanish dominant children achieved approximately the same scores in both languages (See Figure 1). The main effect for language of test was also significant (M for English age scores = 77.1, M for Spanish age scores = 60.0, $F = 58.5$, $p = .0000$; M for English grade scores = 81.0, M for Spanish grade scores = 63.2, $F = 29.78$, $p = .0002$). The main effect for language dominance group was not significant for either analysis. For reading scores, the effects of native language testing appeared to be mediated by children's language dominance, with English dominant children being penalized by Spanish language testing.

A significant interaction between language dominance and language of testing was also found for math age and grade scores (F for age score interaction term = 6.06, $p = .0192$; F for grade score interaction term = 7.38, $p = .0108$). English dominant children achieved slightly higher English than Spanish scores, while Spanish dominant children achieved slightly higher Spanish than English scores. No significant main effects were found.

A significant main effect for language of testing was found for both age and grade written language scores (M for English age scores = 77.2, M for Spanish age scores = 64.5, $F = 17.73$, $p = .0005$; M for English grade scores = 83.1, M for Spanish grade scores = 65.4, $F = 25.27$, $p = .0001$). No significant main effects for language dominance or interactions were found. Both English and Spanish dominant children scored significantly lower on the Spanish written language subtest.

The failure of Spanish dominant children, who had received bilingual education at some point in their school careers, to achieve higher achievement scores in Spanish than in English was somewhat surprising. It seemed possible that these students had not achieved higher scores because their English and Spanish skills did not differ sufficiently for Spanish testing to show beneficial effects. In order to test this hypothesis, achievement scores of students whose Spanish LAS level was 2 or more levels higher than their English LAS level were examined. Only 6 of the 11 students (54.5%) who had been classified as Spanish dominant met this more stringent criterion for Spanish language dominance. English and Spanish achievement scores for this group were compared using a series of t -tests (See Table 10). All Spanish scores except reading age were equal to or exceeded English scores; math age and grade scores were significantly higher. It is unlikely that this result can be attributed to order of testing, as half of these more strongly Spanish dominant students had been tested in Spanish first. Although these results are based on only a small number of students, they tentatively suggest that the lack of effect of Spanish testing observed for the larger sample may be at least in part due to the definition of language dominance used.

Effects of the WISC-R versus the K-ABC on LD eligibility. The IQ-achievement discrepancies which were described previously were used to examine the effect of type of IQ test on LD eligibility. Percentages of children who were eligible based on the WISC-R were compared to those who were eligible based on the K-ABC. Students fell into one of three groups: those who were (a) consistently assigned the same eligibility status regardless of IQ measure (i.e., the total of those who were eligible using results from both measures and those who were ineligible based on both measures); (b) eligible when the Full Scale WISC-R score was used as a measure of IQ but were not eligible when the K-ABC Mental Processing Composite was used; and (c) eligible when the K-ABC Mental Processing Composite was used as a measure of IQ but were not eligible when the Full Scale WISC-R was used (see Table 11). Percentages of students who were consistently eligible were high for all groups, and ranged from 64% to 100% for Spanish dominant students, from 67% to 100% for English dominant students and from 68% to 100% for the full sample. Where disagreements between tests occurred, more students were eligible based on K-ABC results

obtained, a handicapping condition of mental retardation is less likely to be identified. There is also a greater chance that a discrepancy between IQ and achievement will be found, resulting in a handicapping condition of learning disability. If other studies confirm that bilingual children's scores on the K-ABC are consistently higher than their scores on the WISC-R, future research and policy should consider how corrective formulas to insure that identification of handicapping conditions is consistent across tests can be established.

Group results for Spanish versus English achievement testing suggest that children's optimum performance was obtained with English testing. However, when scores for individual subjects were examined, this was not always the case. Follow-up analyses showed that some Spanish dominant children (between 9% and 17% of the group, depending on which IQ test and area of achievement were used in discrepancy calculations) and one English dominant child would qualify for LD services based on English, but not on Spanish achievement scores. This finding underscores the need to consider native language assessment procedures for any bilingual child, in that English only testing would have resulted in misplacement in special education for this group of children.

Interpretation of achievement results must also be grounded in information about the nature and extent of native language instruction. Although all students were, or had been, in a bilingual education program, state and district policy mandate that the amount of native language instruction received depends upon whether students are stronger in English or in the primary language. Students who have stronger English skills are considered LEP, but receive minimal native language basic skills instruction, with at least some of each content area subject being taught using ESL methodology. A different study conducted in the same district (Polyzoi, et. al., 1987) found that the majority of students in bilingual education received mixed language instruction in language arts, math, science and social studies. It is therefore possible that both English and Spanish testing underestimated achievement levels of this group of children. Students who have been exposed to mixed language instruction may need to have items presented in both languages to facilitate their maximum recall of learned material.

The discrepancy model for determining the presence of a learning disability has been criticized previously on statistical grounds (Reynolds, 1986). Results of this study provide evidence that this model may not provide a reliable method for identifying learning disabilities in bilingual children. The type of achievement score (age or grade) used in discrepancy calculations may determine whether a child qualifies for services. Since the majority of subjects had been retained prior to referral, age and grade scores gave very different achievement estimates. Both English and Spanish age scores for all three achievement areas were significantly lower than grade scores, resulting in different percentages of special education eligibility. For example, when the Full Scale WISC-R IQ is compared to English Woodcock-Johnson scores, the percentage of Spanish dominant children who qualify in the areas of reading and math does not change. However, the percentage of Spanish dominant students who qualify in the area of written language increases from 9% to 18%, and the percentage of English dominant students who qualify increases in all three achievement areas. The largest increase occurs for math, in which the percentage of eligible students increases from 5% using grade scores to 20% using age scores. Research suggests that retention prior to referral is a common practice (see, for example, Ortiz et al., 1985). Policy should address which score may be used after a child has been retained. It is also of paramount importance that assessment personnel clearly document whether age or grade scores have been used to establish the existence of a severe discrepancy.

than on WISC-R results. This effect was most pronounced for Spanish dominant students. Only one case in which a student was eligible based on WISC-R results but not eligible based on K-ABC results was found.

Effects of Spanish versus English achievement testing on LD eligibility. Discrepancy scores based on English versus Spanish testing of reading, math and written language skills were used to classify students into the three groups which have been described above (see Table 12). Results suggested only moderate agreement about LD eligibility when achievement tests were administered in two languages, with percentages of agreement being highest for Spanish dominant children. Percentages of consistent eligibility ranged from 43% to 95% for the full sample, from 11% to 90% for English dominant children and from 46% to 100% for Spanish dominant children. In most cases, when the two tests did not result in consistent eligibility, students were more frequently eligible when Spanish achievement scores were used to calculate discrepancies than when English achievement scores were used.

Discussion

In examining results of this study, it is important to consider that only elementary-school-age Hispanic students from Texas and a limited number of tests are represented in the data. Results may not be generalizable to other age and language groups or to other measures of IQ and achievement. Additionally, while subjects represented all referrals of LEP or former LEP children to special education over a one-year period, the number of children available was relatively small. Finally, special education eligibility results are based on test scores only. In practice, eligibility committees have access to other information which might cause them to deemphasize the use of test scores in making eligibility decisions. Eligibility percentages presented here may not exactly represent the percentages of children who would be found to be eligible in an actual placement situation.

Results of this study suggest only a moderate relationship between language proficiency and IQ and achievement test scores. Few significant correlations were found between LAS scores and other test scores; most test means did not differ for Spanish and English dominant children, and percentages of students eligible for LD programs did not differ greatly across groups. In part, this finding may be an artifact of the sample obtained here. Twenty-two percent of students achieved the same LAS overall proficiency level in both languages, and an additional 40% differed by only one level, suggesting that the majority of subjects had fairly equal proficiency in Spanish and English. Stronger relationships between language proficiency and other scores might have been obtained for children whose proficiency in their dominant language further exceeded their proficiency in their weaker language. Different results might also have been obtained if an additional measure or a measure other than the LAS had been used to establish relative language proficiency.

The effect of language of administration on IQ test scores within language dominance groups was difficult to assess. The K-ABC and WISC-R differed in language of administration, but the two tests also have different theoretical bases. Fourqurean (1987) found that K-ABC Mental Processing Composite scores were significantly higher than WISC-R Full Scale IQs for a group of 42 Hispanic LEP LD children when testing was conducted mainly in English, with some use of Spanish instructions as needed for both tests. The K-ABC and WISC-R may give different estimates of intellectual functioning for bilingual children even when language of administration is held constant. However, as Fourqurean points out, no matter what their cause, the score differences on the two tests have important implications for special education eligibility. When a higher IQ score is

Additionally, whether or not a child is judged to be handicapped can vary greatly with the assessment battery used. While the K-ABC and WISC-R were generally consistent, children were identified as LD somewhat more frequently by the K-ABC and were also identified more often by Spanish than English achievement testing.

Results of this study suggest several directions for future policy and research. First, an information base that results in clearer guidelines for selecting the testing procedures and language of test administration for bilingual children is needed. At present, the way in which testing is conducted, rather than the actual presence or absence of a handicapping condition, may determine whether a child receives special education. Additionally, empirically-based, more reliable models for determining the presence of a learning disability which can serve as alternatives to the present discrepancy model should be explored.

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Table 1

Comparisons of Mean Age and Grade Woodcock-Johnson Psycho-Educational Battery and Bateria Woodcock Psico-Educativa Achievement Standard Scores for Referred Bilingual Hispanic Students

Subtest	Test							
	Woodcock Johnson Psycho-Educational Battery				Bateria Woodcock Psico-Educativa			
	Age Score	Grade Score	t	n	Age Score	Grade Score	t	n
Reading	76.3	83.0	-6.72**	40	58.6	63.6	-2.15*	18
Mathematics	76.3	87.3	-8.47**	40	77.0	88.1	-7.55**	39
Written Language	77.8	85.3	-7.36**	40	63.9	67.3	-2.14*	35

Note. Bateria scores which fell below test norms have been excluded from means.

* $p < .05$. ** $p < .01$.

Table 2
Comparisons of English and Spanish Language Assessment Scale
(LAS) Raw Scores of Spanish Dominant and English Dominant
Referred Bilingual Students

	Scores Within Groups				
	Score				
Group	English	Spanish	n	t	
English Dominant	77.9	55.9	20	6.26**	
Spanish Dominant	69.2	84.2	11	-5.84**	
	Scores Between Groups				
	Group				
Score	English Dominant	n	Spanish Dominant	n	t
English	77.9	20	69.2	11	2.58*
Spanish	55.9	20	84.2	11	-4.74**

* $p \leq .05$. ** $p \leq .01$.

Table 3
Significant ($p \leq .05$) Correlations Between English and Spanish LAS Scores and IQ and Achievement Scores

Scores Correlated	r	n ^a
English LAS to:		
WISC-R Full IQ	.27*	40
WISC-R Verbal IQ	.30*	40
WISC-R Information Subtest	.33*	40
WISC-R Similarities Subtest	.28*	40
WISC-R Comprehension Subtest	.31*	39
K-ABC Simultaneous Processing Score	.26*	40
K-ABC Riddles Achievement Subtest	.35**	40
Woodcock-Johnson Reading Age Score	.36**	40
Woodcock-Johnson Reading Grade Score	.30*	40
Woodcock-Johnson Math Age Score	.35**	40
Woodcock-Johnson Math Grade Score	.30*	40
Bateria Woodcock Reading Age Score	-.45*	19
Bateria Woodcock Grade Score	-.43*	21
Bateria Woodcock Written Language Age Score	-.40**	37
Spanish LAS to:		
WISC-R Verbal IQ	-.30*	40
WISC-R Arithmetic Subtest	-.30*	40
WISC-R Vocabulary Subtest	-.36*	40
K-ABC Achievement Composite	-.34*	39
K-ABC Faces and Places Achievement Subtest	-.39**	40
K-ABC Reading/Decoding Achievement Subtest	-.33*	40
K-ABC Reading/Understanding Achievement Subtest	-.28*	40

a Scores on the Bateria Woodcock Psico-Educativa which fell below test norms were excluded from analyses

* $p \leq .05$. ** $p \leq .01$.

Table 4
Mean WISC-R Scores for Referred Bilingual Hispanic Children by
Language Dominance Group

Score	Group		t
	Spanish Dominant (n = 11)	English Dominant (n = 20)	
IQ Scores			
Verbal	64.8	75.1	2.60*
Performance	94.5	95.0	0.11
Full	76.4	83.3	1.79
Subtest Scores			
Verbal			
Information	2.5	4.6	2.79**
Similarities	5.2	6.6	1.21
Arithmetic	5.9	7.3	1.94
Vocabulary	2.7	5.0	2.59*
Comprehension	5.3	6.7 ^a	2.05*
Digit Span	6.8 ^b	6.7 ^c	-0.07
Performance			
Picture Completion	9.1	8.5	-0.56
Picture Arrangement	9.4	10.8	1.13
Block design	7.0	8.5	1.33
Object Assembly	8.8	9.3	0.45
Coding	9.8	9.7	-0.09

^a n = 19.

^b n = 8.

^c n = 15.

* p ≤ .05. ** p ≤ .01.

Table 5
Mean K-ABC Scores for Referred Bilingual Children by Language
Dominance Group

Area/Score	Group		t
	Spanish Dominant (n = 11)	English Dominant (n = 20)	
Mental Processing			
Simultaneous	83.4	90.6	1.52
Sequential	86.3	85.9	-0.08
Composite	82.8	86.9	0.83
Achievement			
Faces and Places	66.0	80.3	3.21*
Arithmetic	74.8	79.9	1.39
Riddles	72.9	80.3	2.15
Reading/Decoding	71.2	81.2	2.34*
Reading/Understanding	72.0	78.2	1.58
Composite	68.0	76.4	2.06

* $p \leq .05$

Table 6
Mean Woodcock-Johnson Psycho-Educational Battery and Bateria Woodcock Psico-Educativa Achievement Standard Scores for Referred Bilingual Hispanic Children by Language Dominance Group

Test/Subtest		Group					
		Spanish		English		t	
		Dominant		Dominant			
M	n	M	n				
Woodcock-Johnson							
Psycho-Educational Battery							
Reading	Age Score	67.1	11	80.4	20	2.86*	
	Grade Score	71.6	11	86.6	20	3.11*	
Math	Age Score	74.2	11	79.8	20	1.18	
	Grade Score	84.5	11	89.9	20	1.08	
Written Language							
	Age Score	74.6	11	78.4	20	0.84	
	Grade Score	80.5	11	85.3	20	0.85	
Bateria Woodcock							
Psico-Educativa ^a							
Reading	Age Score	65.6	5	54.4	9	-1.53	
	Grade Score	65.5	6	60.9	9	-0.72	
Math	Age Score	79.6	11	77.4	19	-0.44	
	Grade Score	91.6	11	87.1	19	-0.88	
Written Language							
	Age Score	67.4	9	61.6	19	-1.43	
	Grade Score	66.9	11	63.9	18	-0.60	

a Scores which fell below test norms were excluded from means.

* $p < .01$.

Table 7

Percentage of Students with IQ-Achievement Age Score Differences Greater than One Standard Deviation by Language Group

Measure of IQ	Language Group											
	Spanish Dominant (n = 11)						English Dominant (n = 20)					
	Achievement Area						Achievement Area					
	Reading		Mathematics		Written Language		Reading		Mathematics		Written Language	
	WJE	BWPE ^a	WJE	BWPE ^b	WJE	BWPE ^c	WJE	BWPE ^d	WJE	BWPE ^e	WJE	BWPE ^f
WISC-R												
Full	36.4	40.0	0.0	0.0	18.2	33.3	20.0	88.9	10.0	21.1	20.0	78.9
Verbal	9.1	20.0	0.0	0.0	0.0	0.0	5.0	77.8	0.0	5.3	10.0	36.8
Performance	81.8	80.0	72.7	36.4	63.6	77.8	45.0	100.0	55.0	57.9	40.0	89.5
K-ABC												
Mental												
Processing												
Composite	45.5	40.0	18.2	9.1	36.4	55.6	15.0	88.9	25.0	36.8	20.0	84.2
Simultaneous	45.5	60.0	9.1	18.2	36.4	66.7	30.0	88.9	40.0	42.1	30.0	89.5
Sequential	45.5	60.0	27.3	36.4	36.4	55.6	10.0	100.0	30.0	31.6	30.0	63.2

Note. WJE = Woodcock Johnson Psycho-Educational Battery; BWPE = Bateria Woodcock Psico-Educativa en Español.

a n = 5 d n = 9

b n = 11 e n = 19

c n = 9 f n = 19

Table 8
Percentage of Students with IQ-Achievement Grade Score Differences Greater than One Standard Deviation by Language Group

Measure of IQ	Language Group											
	Spanish Dominant (n = 11)						English Dominant (n = 20)					
	Achievement Area						Achievement Area					
	Reading		Mathematics		Written Language		Reading		Mathematics		Written Language	
	WJE	BWPE ^a	WJE	BWPE ^b	WJE	BWPE ^c	WJE	BWPE ^d	WJE	BWPE ^e	WJE	BWPE ^f
WISC-R												
Full	36.4	50.0	0.0	0.0	9.1	36.4	15.0	66.7	5.0	5.3	15.0	61.1
Verbal	0.0	16.7	0.0	0.0	0.0	18.2	0.0	44.4	0.0	0.0	0.0	44.4
Performance	54.5	66.7	27.3	9.1	45.5	72.7	35.0	77.8	25.0	47.4	20.0	83.3
K-ABC												
Mental Processing												
Composite	45.5	50.0	18.2	9.1	36.4	72.7	10.0	55.6	15.0	15.8	20.0	61.1
Simultaneous	36.4	50.0	9.1	9.1	36.4	72.7	15.0	88.9	15.0	26.3	20.0	66.7
Sequential	45.5	50.0	18.2	18.2	27.3	54.5	10.0	44.4	25.0	26.3	20.0	50.0

Note. WJE = Woodcock Johnson Psycho-Educational Battery; BWPE = Bateria Woodcock Psico-Educativa en Español.

^a n = 6 ^d n = 9

^b n = 11 ^e n = 19

^c n = 11 ^f n = 18

Table 9

Percentage of Students with IQ-K-ABC Achievement Differences Greater than One Standard Deviation by Language Group

Measure of IQ	Language Group							
	Spanish Dominant (n = 11)				English Dominant (n = 20)			
	K-ABC Achievement Area				K-ABC Achievement Area			
	Achievement Composite ^a	Reading/ Decoding	Reading/ Understanding	Math	Achievement Composite	Reading/ Decoding	Reading/ Understanding	Math
WISC-R								
Full	40.0	36.4	9.1	0.0	20.0	15.0	30.0	0.0
Verbal	0.0	0.0	0.0	0.0	5.0	5.0	10.0	0.0
Performance	90.0	81.8	72.7	72.7	40.0	45.0	45.0	40.0
K-ABC								
Mental								
Processing								
Composite	40.0	45.5	45.5	18.2	30.0	20.0	30.0	20.0
Simultaneous	40.0	63.6	36.4	18.2	35.0	30.0	35.0	15.0
Sequential	60.0	45.5	54.5	27.3	30.0	15.0	15.0	25.0

^a n = 10

Table 10
Mean Achievement Standard Scores on the Woodcock-Johnson
Psycho-Educational Battery and the Bateria Woodcock Psico-
Educativa for Strongly Spanish Dominant Children

Area/Type of Score	Test Language		n ^a	t
	English	Spanish		
Reading Age	61.5	60.5	4	0.29
	62.4	64.6	5	-0.66
Math Age	70.5	79.5	6	-9.32**
	79.8	90.5	6	-6.40**
Written Language				
Age	65.8	69.5	6	-0.67
Grade	68.3	71.7	6	-0.38

Note. Children were considered to be strongly Spanish dominant if their Spanish LAS level exceeded their English LAS level by two levels or more.

a Children whose Spanish scores fell below test norms were excluded from analyses.

** $p \leq .001$.

Table 11

Percentages of Referred Bilingual Students Eligible for Learning Disabilities Programs Using Spanish and English Woodcock-Johnson Achievement Scores in Discrepancy Calculations by Language Group

Area/Score	Group								
	Spanish Dominant (n = 11) ^a			English Dominant (n = 20) ^a			Total (n = 40) ^b		
	Consistent ^c Eligibility	Eligible from English only	Eligible from Spanish only	Consistent ^c Eligibility	Eligible from English only	Eligible from Spanish only	Consistent ^c Eligibility	Eligible from English only	Eligible from Spanish only
WISC-R Full Scale IQ									
Reading									
Age	100.0	0.0	0.0	33.3	0.0	66.7	52.6	0.0	47.4
Grade	66.0	16.7	16.7	33.3	0.0	66.7	47.6	4.8	47.6
Math									
Age	100.0	0.0	0.0	79.0	5.3	15.8	84.7	5.1	10.3
Grade	100.0	0.0	0.0	89.5	5.3	5.3	94.9	2.6	2.6
Written Language									
Age	55.6	11.1	33.3	42.2	0.0	57.9	45.9	2.7	51.4
Grade	54.5	9.1	36.4	50.0	0.0	50.0	52.7	2.6	44.7
K-ABC Mental Processing Composite									
Reading									
Age	100.0	0.0	0.0	11.1	0.0	88.9	47.4	0.0	52.6
Grade	66.6	16.7	16.7	44.4	0.0	55.6	57.1	4.8	38.1
Math									
Age	90.9	9.1	0.0	89.5	0.0	10.5	87.2	7.7	5.1
Grade	90.9	9.1	0.0	89.4	5.3	5.3	92.3	5.1	2.6
Written Language									
Age	55.5	11.1	33.3	36.9	0.0	63.2	43.2	5.4	51.4
Grade	45.5	9.1	45.5	61.1	0.0	38.9	52.6	2.6	18.4

^a Students whose Spanish Achievement scores fell below test norms were excluded from this table. The number of subjects is therefore lower for some subtests.

^b The total sample includes 9 students who had equal Spanish and English LAS levels. These students were not considered to be dominant in either language.

^c This column indicates the percentage of students for whom results of discrepancy calculations were the same regardless of the language of achievement testing, i.e., it represents the total of those who were eligible based on both their English and Spanish achievement scores plus those who were ineligible based on both scores.

Table 12

Percentages of Referred Bilingual Students Eligible for Learning Disabilities Programs Using K-ABC and WISC-R IQ Scores in Discrepancy Calculations by Language Group

Area/Score	Group								
	Spanish Dominant (n = 11)			English Dominant (n = 20)			Total (n = 40) ^a		
	Consistent ^b Eligibility	Eligible from WISC-R only	Eligible from K-ABC only	Consistent ^b Eligibility	Eligible from WISC-R only	Eligible from K-ABC only	Consistent ^b Eligibility	Eligible from WISC-R only	Eligible from K-ABC only
English									
Woodcock-Johnson									
Reading Age Score	90.9	0.0	9.1	85.0	10.0	5.0	87.5	5.0	7.5
Grade Score	90.9	0.0	9.1	95.0	5.0	0.0	90.0	2.5	7.5
Math Age Score	81.8	0.0	18.2	75.0	5.0	20.0	72.5	2.5	25.0
Grade Score	81.8	0.0	18.2	90.0	0.0	10.0	90.0	0.0	10.0
Written Language									
Age Score	81.8	0.0	18.2	80.0	10.0	10.0	77.5	5.0	17.5
Grade Score	72.7	0.0	27.3	85.0	5.0	10.0	85.0	2.5	12.5
Spanish									
Bateria-Woodcock									
Reading Age Score	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Grade Score	100.0	0.0	0.0	66.6	22.2	11.1	80.9	9.5	9.5
Math Age Score	90.9	0.0	9.1	73.7	5.3	21.1	79.5	2.6	17.9
Grade Score	90.9	0.0	9.1	78.9	5.3	15.8	87.2	2.6	10.3
Written Language									
Age Score	77.7	0.0	22.2	84.2	5.3	10.5	83.8	2.7	13.5
Grade Score	63.7	0.0	36.4	100.0	0.0	0.0	86.8	0.0	13.2
English/K-ABC									
Overall Achievement	80.0 ^c	10.0	10.0	70.0	10.0	20.0	74.4	7.7	17.9
Math	81.8	0.0	18.2	80.0	0.0	20.0	80.0	0.0	20.0
Reading/Decoding	90.9	0.0	9.1	85.0	5.0	10.0	85.0	2.5	12.5
Reading/ Understanding	63.6	0.0	36.4	70.0	15.0	15.0	67.5	7.5	25.0

^a The total sample includes 9 students who had equal Spanish and English LAS levels. These students were not considered to be dominant in either language.

^b This column includes the percentage of students for whom results of discrepancy calculations were the same regardless of the language of achievement testing, i.e., it represents the total of those who were eligible based on both K-ABC and WISC-R scores plus those who were ineligible based on both scores.

^c n = 10

Figure 1
Reading Grade Scores of Spanish and English Dominant
Referred Bilingual Children

